

January 4, 2013

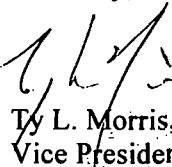
Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
901 North 5th Street
Kansas City, KS 66101

Re: The Doe Run Company – Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period October 1, 2012 through October 31, 2012 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,


Ty L. Morris, P.E., R.G.
Vice President

TLM/jms
Enclosures
c: Mark Nations – TDRC
Matt Wohl – TDRC (electronic only)
Kathy Rangen – MDNR
Tim Skoglund – Barr Engineering

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Superfund

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Elvins/Rivermines Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: October 1, 2012 – October 31, 2012

1. Actions Performed and Problems Encountered This Period:

- a. Continued operating the roughing filter during the period and diverting flow around the ZVI/sand filter, aeration tank, and final sand filter.
- b. Continued to take analytical samples two to three times a week during the period. Analytical results are described below and included with this progress report. It should be noted that on October 19, 2012, Doe Run started taking these samples from the end of the bypass pipe rather than the standpipe due to low water elevation in the standpipe.
- c. Continued to have head loss issues within the roughing filter and its associated piping system. This is primarily occurring as a result of the metal sulfides that have been deposited in the system as a result of the treatment process.
- d. Continued efforts to bench test possible renovations to the iron/sand filter and system piping.
- e. Continued work on the task of mixing and installing the organic media. As of the end of the period, it is estimated that approximately 85% of the media has been mixed and placed in the pond.

2. Analytical Data and Results Received This Period:

- a. Dissolved zinc levels in the roughing filter effluent ranged between 0.003 mg/L and 0.35 mg/L.
- b. Total zinc levels in the roughing filter effluent ranged between 3.10 mg/L and 22.84 mg/L.
- c. Iron concentrations in the roughing filter effluent ranged between 0.87 mg/L and 1.92 mg/L.
- d. Total suspended solids concentrations in the system effluent were measured during this period starting on October 19, 2012. Levels in the roughing filter effluent ranged between 5.5 mg/L and 9.0 mg/L.
- e. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included in this progress report.
- f. During this period, the Ambient Air Monitoring Report for July 2012 was received. Any issues identified in this report are discussed below. A copy of this document has been sent to your attention.

The July 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No samples were taken with the Rivermines #3 (Water Treatment Plant) TSP monitor on 07/02/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the TSP monitors on 07/04/12 due to the holiday.

3. Developments Anticipated and Work Scheduled for Next Period:

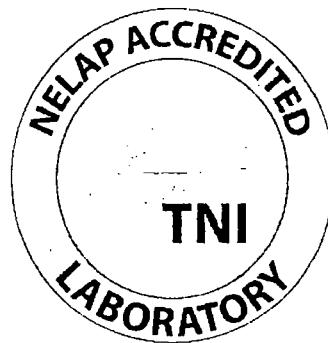
- a. Continue analytical sampling and field measurements three times a week. No WET tests are planned.
- b. Continue to operate the system with the bypass pipe.
- c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- d. Complete air monitoring activities as described in the Removal Action Work Plan.

- e. Continue bench testing secondary treatment options that could be added to the roughing filter of the pilot test.
 - f. Continue renovations to the western treatment pond. These activities will focus on mixing and placing media in the pond. Once this work is completed, the distribution system will be constructed and put in place on top of the media.
- 4. Changes in Personnel:**
- a. None.
- 5. Issues or Problems Arising This Period:**
- a. None.
- 6. Resolution of Issues or Problems Arising This Period:**
- a. None.

End of Monthly Progress Report

November 02, 2012

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001



RE: Rivermines MTS-25/86-0009

WorkOrder: 12100831

Dear Allison Olds:

TEKLAB, INC received 4 samples on 10/17/2012 10:00:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

This reporting package includes the following:

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Definitions

<http://www.teklabinc.com/>

Client: Barr Engineering Company
Client Project: Rivermines MTS-25/86-0009

Work Order: 12100831
Report Date: 02-Nov-12

Abbr Definition

- CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI Did not ignite
- DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH IL Dept. of Public Health
- LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MB Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW Molecular weight
- ND Not Detected at the Reporting Limit
- NELAP NELAP Accredited
- PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
- RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
- RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
- SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
- Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
- TNTC Too numerous to count (> 200 CFU)

Qualifiers

- | | |
|--|---|
| # - Unknown hydrocarbon | B - Analyte detected in associated Method Blank |
| E - Value above quantitation range | H - Holding times exceeded |
| M - Manual Integration used to determine area response | ND - Not Detected at the Reporting Limit |
| R - RPD outside accepted recovery limits | S - Spike Recovery outside recovery limits |
| X - Value exceeds Maximum Contaminant Level | |

Client: Barr Engineering Company
Client Project: Rivermines MTS-25/86-0009

Work Order: 12100831
Report Date: 02-Nov-12

Cooler Receipt Temp: 1.4 °C

This report was revised on 11/02/2012 per Terri Olson's request. The reason for the revision is add the Method Blank and LCS to the QC report for Zinc. Please replace report dated 10/22/2012 with this report. MLA 11/02/12

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	kmcclain@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2013	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2013	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T10470451S-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2013	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville

Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

Lab ID: 12100831-001

Client Sample ID: RM-001

Matrix: WASTE WATER

Collection Date: 10/16/2012 13:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	500		1010	mg/L	50	10/18/2012 2:51	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.55		1	10/17/2012 14:03	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO ₃)	NELAP	5		1200	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	10/17/2012 18:21	R169410
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	10/17/2012 13:47	R169428
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		1.0	mg/L	1	10/18/2012 14:20	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		10.5	µg/L	1	10/18/2012 12:15	82578
Zinc	NELAP	10.0		16800	µg/L	1	10/18/2012 12:15	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		12.1	µg/L	1	10/18/2012 13:32	82577
Zinc	NELAP	10.0	S	17600	µg/L	1	10/18/2012 13:32	82577
MS QC limits for Zn are not applicable due to high sample/spike ratio.								
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	15.2	µg/L	1	10/18/2012 11:21	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	15.0	µg/L	1	10/18/2012 13:44	82567

Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

Lab ID: 12100831-002

Client Sample ID: RM-Dup

Matrix: WASTE WATER

Collection Date: 10/16/2012 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	1000	S	1070	mg/L	100	10/19/2012 23:52	R169574
<i>MS/MSD did not recover within control limits due to matrix interference.</i>								
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.56		1	10/17/2012 14:04	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO ₃)	NELAP	5		1180	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	10/17/2012 18:30	R169410
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		< 1.0	mg/L	1	10/18/2012 14:26	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		10.2	µg/L	1	10/18/2012 12:32	82578
Zinc	NELAP	10.0	S	16800	µg/L	1	10/18/2012 12:32	82578
<i>MS QC limits for Zn are not applicable due to high sample/spike ratio.</i>								
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		12.4	µg/L	1	10/18/2012 13:43	82577
Zinc	NELAP	10.0		17900	µg/L	1	10/18/2012 13:43	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	10.0	X	20.2	µg/L	5	10/18/2012 15:40	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	4.00	X	16.1	µg/L	2	10/18/2012 13:48	82567

Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company
Client Project: Rivermines MTS-25/86-0009

Work Order: 12100831
Report Date: 02-Nov-12

Lab ID: 12100831-003

Client Sample ID: RM-US

Matrix: WASTE WATER

Collection Date: 10/16/2012 13:15

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	20		55	mg/L	2	10/18/2012 3:18	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		8.03		1	10/17/2012 14:06	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO ₃)	NELAP	5		280	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	10/17/2012 18:30	R169410
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		3.0	mg/L	1	10/18/2012 14:33	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	10/18/2012 12:43	82578
Zinc	NELAP	10.0		< 10.0	µg/L	1	10/18/2012 12:43	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	10/18/2012 13:47	82577
Zinc	NELAP	10.0		< 10.0	µg/L	1	10/18/2012 13:47	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		2.68	µg/L	1	10/18/2012 11:47	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		< 2.00	µg/L	1	10/18/2012 13:58	82567

Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company
 Client Project: Rivermines MTS-25/86-0009

Work Order: 12100831
 Report Date: 02-Nov-12

Lab ID: 12100831-004

Matrix: WASTE WATER

Client Sample ID: RM-DS

Collection Date: 10/16/2012 12:55

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	50		163	mg/L	5	10/18/2012 3:20	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.80		1	10/17/2012 14:14	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO ₃)	NELAP	5		320	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	10/17/2012 18:30	R169410
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		2.9	mg/L	1	10/18/2012 15:36	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	10/18/2012 12:48	82578
Zinc	NELAP	10.0		880	µg/L	1	10/18/2012 12:48	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	10/18/2012 13:51	82577
Zinc	NELAP	10.0		962	µg/L	1	10/18/2012 13:51	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		4.55	µg/L	1	10/18/2012 11:51	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		2.14	µg/L	1	10/18/2012 16:00	82567



Sample Summary

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
12100831-001	RM-001	Waste Water	5	10/16/2012 13:45
12100831-002	RM-Dup	Waste Water	5	10/16/2012 13:50
12100831-003	RM-US	Waste Water	5	10/16/2012 13:15
12100831-004	RM-DS	Waste Water	5	10/16/2012 12:55

Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company
Client Project: Rivermines MTS-25/86-0009

Work Order: 12100831
Report Date: 02-Nov-12

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
12100831-001A	RM-001	10/16/2012 13:45	10/17/2012 10:00		
	Standard Methods 2540 F				10/17/2012 13:47
12100831-001B	RM-001	10/16/2012 13:45	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 2:51
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:03
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/17/2012 18:21
12100831-001C	RM-001	10/16/2012 13:45	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 13:32
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 11:21
12100831-001D	RM-001	10/16/2012 13:45	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 12:15
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 13:44
12100831-001E	RM-001	10/16/2012 13:45	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 14:20
12100831-002A	RM-Dup	10/16/2012 13:50	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/17/2012 18:30
12100831-002B	RM-Dup	10/16/2012 13:50	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/19/2012 23:52
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:04
12100831-002C	RM-Dup	10/16/2012 13:50	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 13:43
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 15:40
12100831-002D	RM-Dup	10/16/2012 13:50	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 12:32
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 13:48
12100831-002E	RM-Dup	10/16/2012 13:50	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 14:26
12100831-003A	RM-US	10/16/2012 13:15	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/17/2012 18:30
12100831-003B	RM-US	10/16/2012 13:15	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 3:18
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:06
12100831-003C	RM-US	10/16/2012 13:15	10/17/2012 10:00		

Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 13:47
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 11:47
12100831-003D	RM-US	10/16/2012 13:15	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 12:43
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 13:58
12100831-003E	RM-US	10/16/2012 13:15	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 14:33
12100831-004A	RM-DS	10/16/2012 12:55	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/17/2012 18:30
12100831-004B	RM-DS	10/16/2012 12:55	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 3:20
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:14
12100831-004C	RM-DS	10/16/2012 12:55	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 13:51
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 11:51
12100831-004D	RM-DS	10/16/2012 12:55	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 12:48
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 16:00
12100831-004E	RM-DS	10/16/2012 12:55	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 15:36

Quality Control Results

<http://www.teklabinc.com/>
Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R169463 SampType: MBLK		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: MBLK													
Sulfate			10				< 10						10/17/2012
Batch R169463 SampType: LCS		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: LCS													
Sulfate			10				22	20	0	109.2	90	110	10/17/2012
Batch R169508 SampType: MBLK		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: MBLK													
Sulfate			10				< 10						10/18/2012
Batch R169508 SampType: LCS		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: LCS													
Sulfate			10				21	20	0	103.0	90	110	10/18/2012
Batch R169547 SampType: MBLK		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: MBLK													
Sulfate			10				< 10						10/19/2012
Batch R169547 SampType: LCS		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: LCS													
Sulfate			10				20	20	0	102.1	90	110	10/19/2012
Batch R169574 SampType: MBLK		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: MBLK													
Sulfate			10				< 10						10/19/2012
Batch R169574 SampType: LCS		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: LCS													
Sulfate			10				21	20	0	102.6	90	110	10/19/2012
Batch R169574 SampType: MS		Units mg/L		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
SampID: 12100831-002BMS													
Sulfate			1000			S	1890	1000	1072	82.2	90	110	10/19/2012

Quality Control Results

<http://www.teklabinc.com/>
Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch	R169574	SampType	MSD	Units	mg/L	RPD Limit 10				
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Sulfate		1000	S	1910	1000	1072	83.6	1893	0.75	10/19/2012

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch	R169403	SampType	LCS	Units	RPD Limit 10					
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lab pH		1.00		6.98	7.00	0	99.7	99.1	100.8	10/17/2012

Batch R169403 SampType: DUP Units

Batch	R169403	SampType	DUP	Units	RPD Limit 10					
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lab pH		1.00		7.56				7.550	0.13	10/17/2012

Batch R169403 SampType: DUP Units

Batch	R169403	SampType	DUP	Units	RPD Limit 10					
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lab pH		1.00		7.56				7.560	0.00	10/17/2012

Batch R169403 SampType: DUP Units

Batch	R169403	SampType	DUP	Units	RPD Limit 10					
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lab pH		1.00		8.01				8.030	0.25	10/17/2012

Batch R169403 SampType: DUP Units

Batch	R169403	SampType	DUP	Units	RPD Limit 10					
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lab pH		1.00		7.83				7.800	0.38	10/17/2012

STANDARD METHODS 2340 C

Batch	R169407	SampType	MBLK	Units	mg/L	RPD Limit 10				
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as (CaCO ₃)		5		< 5						10/17/2012

Batch R169407 SampType: LCS Units mg/L

Batch	R169407	SampType	LCS	Units	mg/L	RPD Limit 10				
							Date	Analyzed		
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as (CaCO ₃)		5		980	1000	0	98.0	90	110	10/17/2012

Quality Control Results

<http://www.teklabinc.com/>
Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

STANDARD METHODS 2340 C

Batch R169407 SampType: MS		Units mg/L						Date Analyzed			
SampID: 12100831-004AMS		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as (CaCO ₃)			5		720	400	320.0	100.0	85	115	10/18/2012

Batch R169407 SampType: MSD		Units mg/L						RPD Limit 10	Date Analyzed		
SampID: 12100831-004AMSD		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Hardness, as (CaCO ₃)			5		740	400	320.0	105.0	720.0	2.74	10/18/2012

STANDARD METHODS 2540 D

Batch R169410 SampType: MBLK		Units mg/L						Date Analyzed			
SampID: MBLK		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Suspended Solids			6		< 6						10/17/2012

Batch R169410 SampType: LCS		Units mg/L						Date Analyzed			
SampID: LCS		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Suspended Solids			6		98	100	0	98.0	85	115	10/17/2012
Total Suspended Solids			6		97	100	0	97.0	85	115	10/17/2012
Total Suspended Solids			6		98	100	0	98.0	85	115	10/17/2012

Batch R169410 SampType: DUP		Units mg/L						RPD Limit 15	Date Analyzed		
SampID: 12100831-004A DUP		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Total Suspended Solids			6		< 6				0	0.00	10/17/2012

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R169504 SampType: MBLK		Units mg/L						Date Analyzed			
SampID: MBLK		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Organic Carbon (TOC)			1.0		< 1.0						10/18/2012

Batch R169504 SampType: LCS		Units mg/L						Date Analyzed			
SampID: LCS		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Organic Carbon (TOC)			10.0		59.9	59.7	0	100.4	90	110	10/18/2012

Batch R169504 SampType: MS		Units mg/L						Date Analyzed			
SampID: 12100831-003EMS		Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Organic Carbon (TOC)			1.0		7.8	5.0	3.040	95.6	85	115	10/18/2012

Quality Control Results

<http://www.teklabinc.com/>
Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch	R169504	SampType:	MSD	Units	mg/L	RPD Limit 10										
																Date Analyzed
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
						Total Organic Carbon (TOC)	1.0		7.9	5.0	3.040	97.0	7.820	0.89	10/18/2012	

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch	82578	SampType:	MBLK	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		< 2.00	2.00	0	0	-100	100	10/18/2012
						Zinc	10.0		< 10.0	10.0	0	0	-100	100	10/18/2012

Batch 82578 SampType: LCS Units µg/L

Batch	82578	SampType:	LCS	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		46.8	50.0	0	93.6	85	115	10/18/2012
						Zinc	10.0		499	500	0	99.9	85	115	10/18/2012

Batch 82578 SampType: MS Units µg/L

Batch	82578	SampType:	MS	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		56.1	50.0	10.2	91.8	75	125	10/18/2012
						Zinc	10.0		17200	500	16840	82.0	75	125	10/18/2012

Batch 82578 SampType: MSD Units µg/L

Batch	82578	SampType:	MSD	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		55.7	50.0	10.2	91.0	56.1	0.72	10/18/2012
						Zinc	10.0	S	17000	500	16840	38.0	17250	1.28	10/18/2012

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch	82577	SampType:	MBLK	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		< 2.00	2.00	0	0	-100	100	10/18/2012
						Zinc	10.0		< 10.0	10.0	0	0	-100	100	10/18/2012

Batch 82577 SampType: LCS Units µg/L

Batch	82577	SampType:	LCS	Units	µg/L	Date Analyzed									
						Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
						Cadmium	2.00		50.9	50.0	0	101.8	85	115	10/18/2012
						Zinc	10.0		538	500	0	107.6	85	115	10/18/2012

Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch	82577	SampType:	MS	Units µg/L							Date Analyzed	
SampID:	12100831-001CMS											
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit			
Cadmium		2.00		62.0	50.0	12.1	99.8	75	125		10/18/2012	

Batch	82577	SampType:	MSD	Units µg/L							RPD Limit 20
SampID:	12100831-001CMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
Cadmium		2.00		61.4	50.0	12.1	98.6	62	0.97		10/18/2012

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch	82570	SampType:	MBLK	Units µg/L							Date Analyzed
SampID:	MB-82570										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit		
Lead		2.00		< 2.00	2.00	0	0	-100	100		10/18/2012

Batch	82570	SampType:	LCS	Units µg/L						
SampID:	LCS-82570									
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed

Lead		2.00		13.4	15.0	0	89.0	85	115		10/18/2012
<hr/>											
Batch 82570 SampType: MS Units µg/L											
SampID: 12100831-002CMS											
<hr/>											

Batch	82570	SampType:	MSD	Units µg/L							RPD Limit 20
SampID:	12100831-002CMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit		

Lead		10.0		33.5	15.0	20.2425	88.1	70	130		10/18/2012
<hr/>											
Batch 82570 SampType: LCS Units µg/L											
SampID: LCS-82570											
<hr/>											

Batch	82570	SampType:	MSD	Units µg/L							RPD Limit 20
SampID:	12100831-002CMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit		

Lead		10.0		33.3	15.0	20.2425	87.2	33.4525	0.40		10/18/2012
<hr/>											
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)											
SampID: MB-82567											
<hr/>											

Batch	82567	SampType:	MBLK	Units µg/L							Date Analyzed
SampID:	MB-82567										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit		

Lead		2.00		< 2.00	2.00	0	0	-100	100		10/18/2012
<hr/>											
Batch 82567 SampType: LCS Units µg/L											
SampID: LCS-82567											
<hr/>											

Batch	82567	SampType:	LCS	Units µg/L							Date Analyzed
SampID:	LCS-82567										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit		

Lead		2.00		13.9	15.0	0	92.9	85	115		10/18/2012
<hr/>											
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)											
SampID: MB-82567											
<hr/>											

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch	SampType:	Units	µg/L	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
82567	MS			Lead	4.00		28.7	15.0	16.065	84.0	70	130	10/18/2012

Batch	SampType:	Units	µg/L	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
82567	MSD			Lead	4.00		28.9	15.0	16.065	85.8	28.6648	0.96	10/18/2012

Receiving Check List

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12100831

Client Project: Rivermines MTS-25/86-0009

Report Date: 02-Nov-12

Carrier: Rick Schmidt

Received By: TWM

Completed by:

On:

17-Oct-12



Timothy W. Mathis

Reviewed by:

On:

17-Oct-12



Michael L. Austin

Pages to follow: Chain of custody

Extra pages included

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>	Temp °C <input type="checkbox"/>	1.4 <input type="checkbox"/>
Type of thermal preservation?	None <input type="checkbox"/>	Ice <input checked="" type="checkbox"/>	Blue Ice <input type="checkbox"/>	Dry Ice <input type="checkbox"/>	
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Reported field parameters measured:	Field <input type="checkbox"/>	Lab <input type="checkbox"/>	NA <input checked="" type="checkbox"/>		
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
<i>When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.</i>					
Water – at least one vial per sample has zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials <input checked="" type="checkbox"/>		
Water - TOX containers have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No TOX containers <input checked="" type="checkbox"/>		
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
NPDES/CWA TCN interferences checked/treated in the field?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>		

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler.

FBI Laboratory

Teklab Chain of Custody

Pg.

of

Workorder 121083

5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618)344-1004 ~ Fax:(618)344-1005

Barr Engineering Co.

Are the samples chilled? Yes No with: Ice Blue icePreserved in Lab Field

1001 Diamond Ridge, Suite 1100

Cooler Temp 14 Sampler SBM

10-17-12
7m

Jefferson City

MO

65109

Comments

Invoice to Mark Nations. Results to Allison Olds and Mark Nations, mnations@doerun.com.
Matrix is surface water.
Metals: Cd, Pb, Zn

Custody Seal intact upon pickup

Rivermines MTS - 25/86-0009

Contact Allison Olds

eMail aolds@barr.com

Phone 573-638-5007

Requested Due Date Standard

Billing/PO Per contract with Doe Run

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
PH	T.S.S.	Sulfate	Settleable Solids	T.O.C.	Total Metals	Dissolved Metals	Hardness								
<input checked="" type="checkbox"/>	<input type="checkbox"/>														
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							

Lab Use Sample ID Sample Date/Time Preservative Matrix

2100831-001	RM-001	10-16-12 13:45	Unpres	Aqueous	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
-002	RM-Dup	10-16-12 13:50	Unpres	Aqueous	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-003	RM-US	10-16-12 13:15	Unpres	Aqueous	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-004	RM-DS	10-16-12 12:55	Unpres	Aqueous	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Unpres	Aqueous	<input type="checkbox"/>										
			Unpres	Aqueous	<input type="checkbox"/>										
			Unpres	Aqueous	<input type="checkbox"/>										
			Unpres	Aqueous	<input type="checkbox"/>										

Doe Lab, Inc.
Courier Pick Up

Relinquished By *	Date/Time	Received By	Date/Time
Stone Molanae R. Schmidt	10-16-12 16:00 10-17-12 10:00	R. Schmid	10-17-12 8:30 10-17-12 10:00

* The individual signing this agreement on behalf of client acknowledges that they have read and understand the terms of this agreement and that they have the authority to sign on behalf of client.

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/1/12	12-6090	RMP ROUGH T	4.9	22840^	ND	ND	820	5.5	1008^	211	890	7.04	64
				326					682				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6090

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/2/12	
Copper	ug/L	ND	0.97	10/2/12	
Lead	ug/L	ND	2.7	10/2/12	
Zinc	ug/L	ND	0.91	10/2/12	
Nickel	ug/L	ND	0.86	10/2/12	
Thallium	ug/L	0.13	1.86	10/2/12	
Iron	ug/L	ND	2.0	10/2/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	482	96%	85-115%	
Copper	ug/L	500	489	98%	85-115%	
Lead	ug/L	500	482	96%	85-115%	
Zinc	ug/L	500	493	99%	85-115%	
Nickel	ug/L	500	493	99%	85-115%	
Iron	ug/L	500	525	105%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6090(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	535	526	107%	105%	75-125%	
Copper	ug/L	0	500	500	459	459	92%	92%	75-125%	
Lead	ug/L	0	500	500	488	488	98%	98%	75-125%	
Zinc	ug/L	228	500	500	787	775	112%	109%	75-125%	
Nickel	ug/L	17	500	500	522	522	101%	101%	75-125%	
Iron	ug/L	10	500	500	561	570	110%	112%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6090

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.48	5	10/2/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6090

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	211	210	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.99	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.96	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.05	3.95-4.05	L12-0002-0048
Slope	97.6%	90-102%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6090

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/1/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6090	mg/l	8.9	4	12.5	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.55	91%	85-115	



QUALIFIERS

Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
F	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/3/2012
Manager	Date
EJS	10/3/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/3/12	12-6167	RMP ROUGH T	11	10590^	ND	ND	315	6.6	1155	198	880	7.2	36
				9.4					795				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6167

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/3/12	
Copper	ug/L	0.20	0.97	10/3/12	
Lead	ug/L	0.16	2.7	10/3/12	
Zinc	ug/L	4.5	0.91	10/3/12	M
Nickel	ug/L	ND	0.86	10/3/12	
Thallium	ug/L	8.7	1.86	10/3/12	M
Iron	ug/L	ND	2.0	10/3/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	487	97%	85-115%	
Copper	ug/L	500	494	99%	85-115%	
Lead	ug/L	500	491	98%	85-115%	
Zinc	ug/L	500	485	97%	85-115%	
Nickel	ug/L	500	494	99%	85-115%	
Iron	ug/L	500	481	96%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6167(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	561	559	112%	112%	75-125%	
Copper	ug/L	0.46	500	500	458	437	92%	87%	75-125%	
Lead	ug/L	0	500	500	515	516	103%	103%	75-125%	
Zinc	ug/L	106	500	500	688	682	116%	115%	75-125%	
Nickel	ug/L	3.8	500	500	511	508	101%	101%	75-125%	
Iron	ug/L	0.61	500	500	608	500	121%	100%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6167

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.45	5	10/9/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	96	96%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6167

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	198	199	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.03	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.02	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.02	3.95-4.05	L12-0002-0048
Slope	94.7%	90-102%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6167

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/3/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6197	mg/l	8.8	4	13	105%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.55	91%	85-115		



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
F	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/10/2012
Manager	Date
EJS	10/10/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/5/12	I2-6230	RMP ROUGH T	2.7	18490^	0.54 J	ND	346	4.5	1918^	208	915	7.01	36
				8.4					857				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6230

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/5/12	
Copper	ug/L	0.17	0.97	10/5/12	
Lead	ug/L	ND	2.7	10/5/12	
Zinc	ug/L	3.4	0.91	10/5/12	M
Nickel	ug/L	0.05	0.86	10/5/12	
Thallium	ug/L	ND	1.86	10/5/12	
Iron	ug/L	7.3	2.0	10/5/12	M

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	482	96%	85-115%	
Copper	ug/L	500	488	98%	85-115%	
Lead	ug/L	500	489	98%	85-115%	
Zinc	ug/L	500	484	97%	85-115%	
Nickel	ug/L	500	486	97%	85-115%	
Iron	ug/L	500	499	100%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6230(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	540	542	108%	108%	75-125%	
Copper	ug/L	0	500	500	449	454	90%	91%	75-125%	
Lead	ug/L	1.1	500	500	497	502	99%	100%	75-125%	
Zinc	ug/L	185	500	500	745	753	112%	114%	75-125%	
Nickel	ug/L	4.6	500	500	502	509	99%	101%	75-125%	
Iron	ug/L	49	500	500	541	575	98%	105%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6230

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.45	5	10/9/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	96	96%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6230

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	208	208	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.03	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.02	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.02	3.95-4.05	L12-0002-0048
Slope	94.7%	90-102%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6230

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/5/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6230	mg/l	9.1	4	12.9	95%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Qualifiers
Sulfate	mg/l	5	4.55	91%	85-115	



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
..	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/10/2012
Manager	Date
EJS	10/10/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/8/12	12-6257	RMP ROUGH T	7.4	6213^	1.2	ND	215	2.1	1673^	180	855	7.03	34
				3.1					1205				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6257

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.05	0.38	10/9/12	
Copper	ug/L	1.1	0.97	10/9/12	M
Lead	ug/L	ND	2.7	10/9/12	
Zinc	ug/L	ND	0.91	10/9/12	
Nickel	ug/L	0.01	0.86	10/9/12	
Thallium	ug/L	0.53	1.86	10/9/12	
Iron	ug/L	ND	2.0	10/9/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	460	92%	85-115%	
Copper	ug/L	500	477	95%	85-115%	
Lead	ug/L	500	467	93%	85-115%	
Zinc	ug/L	500	464	93%	85-115%	
Nickel	ug/L	500	476	95%	85-115%	
Iron	ug/L	500	485	97%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6257(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	488	459	98%	92%	75-125%	
Copper	ug/L	1.7	500	500	425	417	85%	83%	75-125%	
Lead	ug/L	0	500	500	457	434	91%	87%	75-125%	
Zinc	ug/L	62	500	500	571	537	102%	95%	75-125%	
Nickel	ug/L	2.7	500	500	474	455	94%	90%	75-125%	
Iron	ug/L	17	500	500	517	526	100%	102%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6257

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.45	5	10/9/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	96	96%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6257

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	180	183	102%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.03	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.02	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.02	3.95-4.05	L12-0002-0048
Slope	94.7%	90-102%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6257

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/9/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6257	mg/l	8.6	4	12.4	95%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
FS	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H** Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/10/2012
Manager	Date
EJS	10/10/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/10/12	12-6317	RMP ROUGH T	3.9	6046^	ND	ND	235	4.7	1492	193	868	7.12	15
				7.8					1343				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6317

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.06	0.38	10/10/12	
Copper	ug/L	ND	0.97	10/10/12	
Lead	ug/L	ND	2.7	10/10/12	
Zinc	ug/L	0.81	0.91	10/10/12	
Nickel	ug/L	0.09	0.86	10/10/12	
Thallium	ug/L	ND	1.86	10/10/12	
Iron	ug/L	2.3	2.0	10/10/12	M

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	477	95%	85-115%	
Copper	ug/L	500	523	105%	85-115%	
Lead	ug/L	500	488	98%	85-115%	
Zinc	ug/L	500	479	96%	85-115%	
Nickel	ug/L	500	485	97%	85-115%	
Iron	ug/L	500	493	99%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6317(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	539	536	108%	107%	75-125%	
Copper	ug/L	0.32	500	500	550	536	110%	107%	75-125%	
Lead	ug/L	0.34	500	500	538	537	108%	107%	75-125%	
Zinc	ug/L	60	500	500	593	593	107%	107%	75-125%	
Nickel	ug/L	4.3	500	500	537	533	107%	106%	75-125%	
Iron	ug/L	5	500	500	602	602	119%	119%	75-125%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6317

Parameter	Units	Reporting			Qualifiers
		Blank Result	Limit	Analyzed	
Alkalinity	mg/L	1.44	5	10/17/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS	% Rec	Qualifiers
				% Rec	Limits	
Alkalinity	mg/L CaCO ₃	100	100	100%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS	% Rec	Qualifiers
				% Rec	Limits	
Alkalinity	mg/L CaCO ₃	100	101	101%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6317

Parameter	Units	Results	Results Dup	LCS	% Rec	Qualifiers
				% Rec	Limits	
Alkalinity	mg/L CaCO ₃	193	193	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.99	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.01	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	6.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	10	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.01	3.95-4.05	L12-0002-0048

Slope 96.9% 90-102%



Quentin J. Schmidt Analytical Laboratory
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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6317

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/10/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6317	mg/l	8.7	4	12.5	95%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS**SEMO PROJECT****DEFINITIONS**

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
F	Filtered Samples prepared in the field.

15

ANALYTE QUALIFIERS**H** Analysis conducted outside the EPA method holding time.**M** Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.**R** RPD value was outside control limits.**NES** Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/18/2012
Manager	Date
EJS	10/18/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/12/12	12-6352	RMP ROUGH T	11	4235^	ND	ND	226	4.6	1394	192	907	7.08	18
				4.6					1291				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6352

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/15/12	
Copper	ug/L	ND	0.97	10/15/12	
Lead	ug/L	ND	2.7	10/15/12	
Zinc	ug/L	3.1	0.91	10/15/12	M
Nickel	ug/L	0.04	0.86	10/15/12	
Thallium	ug/L	ND	1.86	10/15/12	
Iron	ug/L	ND	2.0	10/15/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	521	104%	85-115%	
Copper	ug/L	500	469	94%	85-115%	
Lead	ug/L	500	508	102%	85-115%	
Zinc	ug/L	500	507	101%	85-115%	
Nickel	ug/L	500	496	99%	85-115%	
Iron	ug/L	500	464	93%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6352(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	522	518	104%	104%	75-125%	
Copper	ug/L	0	500	500	483	486	97%	97%	75-125%	
Lead	ug/L	0.87	500	500	506	508	101%	101%	75-125%	
Zinc	ug/L	42	500	500	548	548	101%	101%	75-125%	
Nickel	ug/L	2.9	500	500	493	491	98%	98%	75-125%	
Iron	ug/L	2.7	500	500	489	500	97%	99%	75-125%	



Quentin J. Schmidt Analytical Laboratory
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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6352

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.44	5	10/17/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	100	100%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	101	101%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6352

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	192	192	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.99	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.01	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	6.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	10	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.01	3.95-4.05	L12-0002-0048
Slope	96.9%	90-102%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6352

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/15/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6352	mg/l	9.1	4	12.3	80%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
.	Filtered Samples prepared in the field.

15

ANALYTE QUALIFIERS

- H** Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/18/2012
Manager	Date
EJS	10/18/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
10/17/12	12-6456	RMP ROUGH T	10	4709^	ND	ND	197	5.1	1048	200	800	6.89	10
				3.7					921				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L12-0001-6456

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/18/12	
Copper	ug/L	2.2	0.97	10/18/12	
Lead	ug/L	0.63	2.7	10/18/12	
Zinc	ug/L	ND	0.91	10/18/12	
Nickel	ug/L	0.02	0.86	10/18/12	
Thallium	ug/L	0.94	1.86	10/18/12	
Iron	ug/L	ND	2.0	10/18/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	514	103%	85-115%	
Copper	ug/L	500	500	100%	85-115%	
Lead	ug/L	500	493	99%	85-115%	
Zinc	ug/L	500	507	101%	85-115%	
Nickel	ug/L	500	491	98%	85-115%	
Iron	ug/L	500	491	98%	85-115%	
Thallium	ug/L	500	496	99%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6456(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	514	500	103%	100%	75-125%	
Copper	ug/L	0.41	500	500	502	501	100%	100%	75-125%	
Lead	ug/L	0.7	500	500	492	479	98%	96%	75-125%	
Zinc	ug/L	47	500	500	537	520	98%	95%	75-125%	
Nickel	ug/L	2.6	500	500	485	475	96%	94%	75-125%	
Iron	ug/L	10	500	500	481	470	94%	92%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L12-0001-6456

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.44	5	10/17/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	100	100%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	101	101%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6456

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	200	199	100%	85-115%	

pH SM4500-H+F	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.99	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.01	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	6.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	10	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.01	3.95-4.05	L12-0002-0048

Slope 96.9% 90-102%



Quentin J. Schmidt Analytical Laboratory
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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6456

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/17/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6456	mg/l	8	4	11.6	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/18/2012
Manager	Date
EJS	10/18/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
10/19/12	12-6606	RMP BYPASS T	ND	3408^	2.2	ND	223	2.2	878	NES	905	7.9	7	2	0.04	7
		RMP BYPASS D		33					789							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6606

METHOD BLANK MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.02	0.38	10/22/12	
Copper	ug/L	0.96	0.97	10/22/12	
Lead	ug/L	0.69	2.7	10/22/12	
Zinc	ug/L	0.05	0.91	10/22/12	
Nickel	ug/L	0.17	0.86	10/22/12	
Thallium	ug/L	ND	1.86	10/22/12	
Iron	ug/L	4.2	2.0	10/22/12	M

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	507	101%	85-125%	
Copper	ug/L	500	493	99%	85-125%	
Lead	ug/L	500	510	102%	85-125%	
Zinc	ug/L	500	498	100%	85-125%	
Nickel	ug/L	500	472	94%	85-125%	
Iron	ug/L	500	481	96%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6606 (1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	556	554	111%	111%	75-125%	
Copper	ug/L	1.9	500	500	525	512	105%	102%	75-125%	
Lead	ug/L	0.28	500	500	525	526	105%	105%	75-125%	
Zinc	ug/L	34	500	500	595	593	112%	112%	75-125%	
Nickel	ug/L	3.2	500	500	468	464	93%	92%	75-125%	
Iron	ug/L	5.2	500	500	401	425	79%	84%	75-125%	



Quentin J. Schmidt Analytical Laboratory
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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6606

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.9	5	10/26/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6606

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	NES	NES		85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	3.98	3.95-4.05	L12-0002-0048
Slope	96.0%	90-102%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

Associated Lab Samples: L12-0001-6606

METHOD BLANK		MATRIX: Water			
Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/22/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6606	mg/l	9.1	4	12.7	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK

MATRIX: Water

Associated Lab Samples: L12-0001-6606

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	0.5	5	10/24/2012	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solid	mg/L	5	5.5	110%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 12-6606

Parameter	Units	Results	Dup Results	Qualifiers
Total Suspended Solid	mg/L	7	9	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solid	mg/L	5	5	100%	75-125	



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
FF	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H** Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/29/2012
Manager	Date
EJS	10/29/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU	
10/22/12	12-6645	RMP BYPASS T	ND	3177^	1.1	ND	238	6.0	1048	NES	855	8.02	8	1	0.13	6
		RMP BYPASS D		158					962							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6645

METHOD BLANK MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.11	0.38	10/23/12	
Copper	ug/L	ND	0.97	10/23/12	
Lead	ug/L	0.006	2.7	10/23/12	
Zinc	ug/L	0.63	0.91	10/23/12	
Nickel	ug/L	0.17	0.86	10/23/12	
Thallium	ug/L	0.02	1.86	10/23/12	
Iron	ug/L	ND	2.0	10/23/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	497	99%	85-125%	
Copper	ug/L	500	480	96%	85-125%	
Lead	ug/L	500	501	100%	85-125%	
Zinc	ug/L	500	489	98%	85-125%	
Nickel	ug/L	500	478	96%	85-125%	
Iron	ug/L	500	495	99%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6645 (1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.002	500	500	494	494	99%	99%	75-125%	
Copper	ug/L	0	500	500	480	474	96%	95%	75-125%	
Lead	ug/L	0.12	500	500	495	497	99%	99%	75-125%	
Zinc	ug/L	32	500	500	518	519	97%	97%	75-125%	
Nickel	ug/L	2.9	500	500	472	467	94%	93%	75-125%	
Iron	ug/L	3.8	500	500	501	502	99%	100%	75-125%	



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6645

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.9	5	10/26/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6645

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	NES	NES		85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	3.98	3.95-4.05	L12-0002-0048

Slope 96.0% 90-102%



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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

Associated Lab Samples: L12-0001-6645

METHOD BLANK MATRIX: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/22/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6645	mg/l	8.5	4	12.1	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



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QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK

MATRIX: Water

Associated Lab Samples: L12-0001-6645

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	0.5	5	10/24/2012	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solid	mg/L	5	5.5	110%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 12-5004

Parameter	Units	Results	Dup Results	Qualifiers
Total Suspended Solid	mg/L	8	9	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solid	mg/L	5	5	100%	75-125	



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43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H** Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/29/2012
Manager	Date
EJS	10/29/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
10/24/12	12-6685	RMP BYPASS T	ND	3527^	2.5	ND	239	6.9	889	212	852	7.02	7.5	1	0.06	4
		RMP BYPASS D		2.7					841							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6685

METHOD BLANK

MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	10/24/12	
Copper	ug/L	0.96	0.97	10/24/12	
Lead	ug/L	0.14	2.7	10/24/12	
Zinc	ug/L	ND	0.91	10/24/12	
Nickel	ug/L	0.31	0.86	10/24/12	
Thallium	ug/L	ND	1.86	10/24/12	
Iron	ug/L	8.8	2.0	10/24/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	492	98%	85-125%	
Copper	ug/L	500	487	97%	85-125%	
Lead	ug/L	500	488	98%	85-125%	
Zinc	ug/L	500	489	98%	85-125%	
Nickel	ug/L	500	482	96%	85-125%	
Iron	ug/L	500	463	93%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6685 (1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	552	542	110%	108%	75-125%	
Copper	ug/L	0.09	500	500	504	493	101%	99%	75-125%	
Lead	ug/L	0	500	500	511	503	102%	101%	75-125%	
Zinc	ug/L	35	500	500	597	586	112%	110%	75-125%	
Nickel	ug/L	3.4	500	500	504	490	100%	97%	75-125%	
Iron	ug/L	4.9	500	500	426	437	84%	86%	75-125%	



Quentin J. Schmidt Analytical Laboratory
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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.9	5	10/26/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6685

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	212	NES	85-115%		

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	3.98	3.95-4.05	L12-0002-0048
Slope	96.0%	90-102%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

Associated Lab Samples: L12-0001-6685

METHOD BLANK MATRIX: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/24/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6685	mg/l	8.5	4	12.6	103%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115	



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QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	ND	5	10/29/2012	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	4.5	90%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	Dup Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	NES	NES		75-125	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	5	100%	75-125	



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/30/2012
Manager	Date
EJS	10/30/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
10/26/12	12-6736	RMP BYPASS T	ND	3514^	ND	ND	238	4.8	871	210	867	7.2	8.5	1.5	0.04	4
		RMP BYPASS D		3.4					818							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



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Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6736

METHOD BLANK

MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.07	0.38	10/29/12	
Copper	ug/L	1.9	0.97	10/29/12	
Lead	ug/L	0.39	2.7	10/29/12	
Zinc	ug/L	0.06	0.91	10/29/12	
Nickel	ug/L	0.14	0.86	10/29/12	
Thallium	ug/L	0.64	1.86	10/29/12	
Iron	ug/L	4.1	2.0	10/29/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	479	96%	85-125%	
Copper	ug/L	500	470	94%	85-125%	
Lead	ug/L	500	477	95%	85-125%	
Zinc	ug/L	500	475	95%	85-125%	
Nickel	ug/L	500	473	95%	85-125%	
Iron	ug/L	500	467	93%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6736 (1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	528	513	106%	103%	75-125%	
Copper	ug/L	0.17	500	500	475	464	95%	93%	75-125%	
Lead	ug/L	0	500	500	491	477	98%	95%	75-125%	
Zinc	ug/L	35	500	500	576	560	108%	105%	75-125%	
Nickel	ug/L	2.8	500	500	484	470	96%	93%	75-125%	
Iron	ug/L	16	500	500	425	448	82%	86%	75-125%	



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6736

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.9	5	10/26/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	97	97%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6736

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	NES	NES		85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	3.98	3.95-4.05	L12-0002-0048
Slope	96.0%	90-102%	



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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

Associated Lab Samples: L12-0001-6685

METHOD BLANK MATRIX: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/26/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6736	mg/l	8.7	4	12.2	88%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	ND	5	10/29/2012	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	4.5	90%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	Dup Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	NES	NES	#####	75-125	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	5	100%	75-125	



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
Filter	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H** Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	10/30/2012
Manager	Date
EJS	10/30/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
10/29/12	12-6775	RMP BYPASS T	ND	3096^	ND	ND	239	7.8	948	183	831	7.61	5.5	1	0.12	8
		RMP BYPASS D	285						917							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6775

METHOD BLANK

MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.07	0.38	10/30/12	
Copper	ug/L	ND	0.97	10/30/12	
Lead	ug/L	ND	2.7	10/30/12	
Zinc	ug/L	ND	0.91	10/30/12	
Nickel	ug/L	ND	0.86	10/30/12	
Thallium	ug/L	0.16	1.86	10/30/12	
Iron	ug/L	5.1	2.0	10/30/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	464	93%	85-125%	
Copper	ug/L	500	466	93%	85-125%	
Lead	ug/L	500	466	93%	85-125%	
Zinc	ug/L	500	459	92%	85-125%	
Nickel	ug/L	500	469	94%	85-125%	
Iron	ug/L	500	459	92%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6775 (1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	461	452	92%	90%	75-125%	
Copper	ug/L	0	500	500	478	474	96%	95%	75-125%	
Lead	ug/L	0	500	500	469	455	94%	91%	75-125%	
Zinc	ug/L	31	500	500	453	445	84%	83%	75-125%	
Nickel	ug/L	2.8	500	500	460	453	91%	90%	75-125%	
Iron	ug/L	7.6	500	500	442	439	87%	86%	75-125%	



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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6775

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.92	5	10/30/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	95	95%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	96	96%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6775

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	NES	NES		85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.03	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	3.98	3.95-4.05	L12-0002-0048

Slope 96.4% 90-102%



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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

Associated Lab Samples: L12-0001-6775

METHOD BLANK MATRIX: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	10/29/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6775	mg/l	8.3	4	12.1	95%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



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QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6775

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	ND	5	10/29/2011	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	4.5	90%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	Dup Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	NES	NES	#####	75-125	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS		Qualifiers
				% Rec	% Rec	
Total Suspended Solid	mg/L	5	5	100%	75-125	



Quentin J. Schmidt Analytical Laboratory

43 Iron County Road No 1 Bldg 3

Viburnum, MO 65566

(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
..	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	11/2/2012
Manager	Date
EJS	11/2/2012

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pH	TSS	Sulfide	Phos	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
10/31/12	12-6868	RMP BYPASS T	1.9 J	3811^	1.1	ND	235	7.2	981	171	851	7.11	9	1.3	.0.3	5
		RMP BYPASS D		348					955							

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



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Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

Associated Lab Samples: L12-0001-6868

METHOD BLANK

MATRIX: Water

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	11/1/12	
Copper	ug/L	0.02	0.97	11/1/12	
Lead	ug/L	ND	2.7	11/1/12	
Zinc	ug/L	2.2	0.91	11/1/12	
Nickel	ug/L	0.07	0.86	11/1/12	
Thallium	ug/L	0.49	1.86	11/1/12	
Iron	ug/L	3.2	2.0	11/1/12	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	493	99%	85-125%	
Copper	ug/L	500	475	95%	85-125%	
Lead	ug/L	500	490	98%	85-125%	
Zinc	ug/L	500	492	98%	85-125%	
Nickel	ug/L	500	487	97%	85-125%	
Iron	ug/L	500	481	96%	85-125%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 12-6868(1/100 Dil)

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	534	530	107%	106%	75-125%	
Copper	ug/L	0	500	500	468	473	94%	95%	75-125%	
Lead	ug/L	0	500	500	489	489	98%	98%	75-125%	
Zinc	ug/L	38	500	500	583	582	109%	109%	75-125%	
Nickel	ug/L	2.9	500	500	490	485	97%	96%	75-125%	
Iron	ug/L	6.9	500	500	456	479	90%	94%	75-125%	



Quentin J. Schmidt Analytical Laboratory
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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

MATRIX: Water

Associated Lab Samples: L12-0001-6868

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.3	5	11/8/12	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	95	95%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	100	95	95%	85-115%	

LABORATORY SAMPLE DUPLICATE 12-6868

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO ₃	171	172	95%	85-115%	

pH SM4500-H+F	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.02	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.01	9.96-10.06	L12-0002-0047
CCV Buffer 10.00	9.99	9.96-10.06	L11-0002-0122
CCV Buffer 4.00	4.01	3.95-4.05	L12-0002-0048
Slope	96.3%	90-102%	



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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAF 300.0

Associated Lab Samples: L12-0001-6868

METHOD BLANK MATRIX: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	11/2/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 12-6868	mg/l	8.5	4	12.1	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.5	90%	85-115		



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QUALITY CONTROL DATA

SEMO PROJECT: RMP ByPass

ANALYSIS DESCRIPTION: 2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L12-0001-6868

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solid	mg/L	1	5	11/5/2012	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	6	120%	75-125	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 12-6868

Parameter	Units	Results	Dup Results	% Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	9	9.5	106%	75-125	

LABORATORY CONTROL SAMPLE L12-0002-0099

Parameter	Units	Conc.	LCS Results	LCS % Rec	% Rec	Qualifiers
Total Suspended Solid	mg/L	5	5.5	110%	75-125	



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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
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J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
F	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JAA
IC	TLL

Report Acceptance	
QAO	Date
GWP	11/9/2012
Manager	Date
EJS	11/9/2012